

Application Serial No. 10/807,289
Response dated November 16, 2006
Reply to Office Action of October 17, 2006

REMARKS

Applicants assume that Examiner's use of the term "gas generant" (which does not appear in the claims) is referring to the solid fuel component of the claimed mixture. Applicants' election is being made based on that assumption. In the event the Examiner meant otherwise, Examiner is respectfully requested to clarify the requirement, with specificity. Applicants hereby elect nitroguanidine as the solid fuel component. Further, Applicants hereby elect a powder shape for the solid fuel component. Claims 1-5, 10, 12-16 are generic. Claims 8-9 and 11 read on the elected species. Examination on the merits of elected claims 1-5 and 8-16 is respectfully requested.

The specification is also amended herein to clarify terminology. During prosecution of the parent application, it was suggested that the term nitrogen monoxide, as used in the first paragraph on Page 3 for example, is equivalent to dinitrogen monoxide, also known as laughing gas, nitrous oxide or N₂O, according to Hawley's Chemical Dictionary. However, the Merck Index equates the term nitrogen monoxide to mononitrogen monoxide, also known as nitric oxide or NO. Relevant excerpts from the Merck Index are submitted herewith. In the first paragraph on Page 3, amended herein for clarification, the critical temperatures and pressures were originally given for the two components, which as stated can be used together in a mixture, and comparing these values to the values provided for nitric oxide (NO) and nitrous oxide (N₂O) in the Merck Index, it is clear that these two different components were intended. Thus, the combination of NO and N₂O is fully supported by the specification, and the specification is amended for clarification consistent with the Merck Index in a manner that presents no new matter.

Claims 9 and 10 are also amended herein to insert commas omitted from the listing of elements in a manner consistent with the specification, such that no new matter is presented.

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An Action on the merits for claims 1-5 and 8-16 is respectfully requested.

Respectfully submitted,

WOOD, HERRON & EVANS LLP.

By: /Kristi L. Davidson/
Kristi L. Davidson, Reg. No. 44,643

2700 Carew Tower
441 Vine Street
Cincinnati, OH 45202
513/241-2324 (voice)
513/241-6234 (facsimile)
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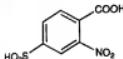
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Published by
Merck Research Laboratories
Division of
MERCK & CO., INC.
Whitehouse Station, N.J.

1996

Org. Syn. coll. 1943, 25, 10. Yellow, fan-shaped crystals. Sol in ~40 parts water; more sol in hot water; slightly sol in methyl or ethyl alcohol. Use as a reagent for cobalt and potassium.

6743. 2-Nitro-4-sulfobenzoic Acid. $C_7H_4NO_5S$; mol wt 241.1. C 34.01%, H 2.04%, N 5.67%, O 45.31%, S 12.97%. Prep by sulfonation of *o*-nitrotoluene and oxidation of the resulting 2-nitro-4-toluenesulfonic acid with potassium permanganate. Hart, *Am. Chem. J.*, 1, 352 (1879-80).



Derives from hydrochloric acid. Stable in air under ordinary conditions.

Alkalimetric standard.

6744. Nitrosyl Chloride. ClNO; mol wt 65.46. C 64.16%, N 21.40%, O 24.44%, NOCl. Best prepared from concentrated sulfuric acid and dry HCl. Coleman *et al.*, *Inorg. Syn.*, 1, 55 (1959).

Non-explosive, very corrosive, reddish-yellow gas; liquid $d_{4}^{20} = 1.37$, solid at -61° . Decomposed by water. Sol in strong H_2SO_4 . Crys temp 167° ; crit press 92.4 atm. The orange color of aqua regia is produced by nitrosyl chloride. *Caution:* Intensely irritating to eyes, skin, mucous membranes. Inhalation may cause pulmonary edema, hemorrhage.

6745. Nitroxy Fluoride. Nitrogen oxyfluoride. FNO; mol wt 49.90. F 38.77%, N 28.58%, O 32.65%. Prepared by Ruff *et al.*, *Z. Anorg. Allgem. Chem.*, 208, 293 (1932); Mallander, *ibid.*, 217, 166 (1934); Faloon, Kenna, *J. Am. Chem. Soc.*, 73, 2937 (1951); Kwasniak, *Handbook of Inorganic and Organic Chemistry*, vol. 1, G. Brauer, Ed., Academic Press, New York, 2nd ed., 1963) pp. 184-85.

Reacts with water to form NO, HNO, and HF. *Caution:* Highly irritating to skin, eyes, mucous membranes. Flaming. Flammable.

Oxidizer in rocket propellants; stabilizing agent for $Li_2S_2O_8$; fluorinating agent.

6746. Nitrosylsulfuric Acid. *Sulfuric acid mononitrate*; *nitroso-sulfuric acid; nitrosyl sulfate*; chamber crystals; *sulfuric acid; nitrosylsulfuric acid; nitrosulfuric acid; monohydrate*; nitrosulfuric acid; nitrosulfuric acid; nitrosulfuric acid if cool in liq oxygen. $d_{4}^{20} = 1.32^{\circ}$, sp. gr. 1.59. d (lit) at bp 132.6, d (solid) 1.719. Trouton const. 21.1. Reacts with water to form NO, HNO, and HF.

Caution: Highly irritating to skin, eyes, mucous membranes. Flaming. Flammable.

Oxidizer in rocket propellants; stabilizing agent for $Li_2S_2O_8$; fluorinating agent.

6747. Nitrosyl Tetrafluoroborate. Nitrosonium tetrafluoroborate; nitrosyl borofluoride; nitrosyl fluoroborate. BF_3NO ; mol wt 116.81. B 9.26%, F 65.06%, N 11.99%, O 13.70%. $NOBF_4$. Prep'd according to the equation: $2BF_3 + NO_2 \rightarrow NOBF_4 + H_2O$. Wilke, *Z. Anorg. Allgem. Chem.*, 150, 215 (1927); Wilke, *Z. Anorg. Allgem. Chem.*, 217, 124 (1934); H. S. Booth, D. R. Martin, *Boron Trifluoride and Its Derivatives* (New York, 1949) p 133 seq. Review of tetrafluoroborates: Sharp, *Advan. Fluorine Chem.*, 1, 68-128 (1960).

Birefringent, orthorhombic, hygroscopic platelets. $d_{4}^{20} = 2.185$. Sublimes at 0.01 mm and 250° without decompr. Decomposed by water. May be stored in glass bottles if absolutely dry.

Caution: In the prep'n of diazonium fluorobrates. *Caution:* Intensely irritating to eyes, skin, mucous membranes. Inhalation may cause pulmonary edema, hemorrhage.

6748. Nitrotoluene. *Methylnitrobenzene*. $C_7H_5NO_2$; mol wt 137.14. C 61.31%, H 5.14%, N 10.21%, O 23.33%. Nitration of toluol by a mixture of HNO_3 and H_2SO_4 yields principally *o*- and *p*-nitrotoluol. Prep'n of *m*-nitrotoluene from 3-nitro-4-amino-toluene and $NaNO_2$: Clark, Taylor, *Org. Syn.*, 3, 91 (1923).



m-Nitrotoluene. Liquid. $d_{4}^{20} = 1.1630$; $d_{4}^{25} = 1.1581$; $d_{4}^{28} = 1.124$; $d_{4}^{30} = 1.1063$. Solidifies in an ice and salt cooling mixture; melts at 15.5° ; $bp_{40} = 213.9$; $bp_{40} = 156.9^{\circ}$; $bp_{40} = 130.7^{\circ}$; $bp_{40} = 112.8^{\circ}$; $bp_{40} = 96.0^{\circ}$; bp, 81.0°; $bp_{40} = 50.2^{\circ}$; $d_{4}^{20} = 1.1526$. Absorption spectrum: Marchlewski, Mayer, *Bull. Acad. Polon. [A]*, 1929, 188. Solv in water at 30° ; 0.498 g/l. Miscible with alcohol and ether. Sol in benzene.

o-Nitrotoluene. Yellowish liquid at ordinary temp. $d_{4}^{20} = 1.1622$, $mp = -10^{\circ}$; bp 222° ; $mp = 1.5472$. Almost insol in water; sol in alcohol, ether, benzene, petrolium ether.

p-Nitrotoluene. Yellowish crystals. $d_{4}^{20} = 1.218$, mp 53.54° ; $bp = 238^{\circ}$; $mp = 106^{\circ}$. Almost insol in water; sol in alcohol, benzene, ether, chloroform, acetone, etc.

6749. Nitroso. *N*-Nitrocarbamide. $CH_4N_2O_2$; mol wt 105.05. C 11.43%, H 2.88%, N 40.00%, O 45.69%. $NH_2CONHNO_2$. Prep'd by the action of concd sulfuric acid upon urea nitrate: Thiele, Lachman, *Ann.*, 288, 281 (1895); Ingersoll, Armendt, *Org. Syn.*, 5, 85 (1925). By dropwise addition of HCl to a cooled mixture of silver cyanate and nitramide in water: Davis, Blanchard, *J. Am. Chem. Soc.*, 51, 1794 (1929).

Platelets from alcohol + petr ether dec 158.4-158.8°. K at 25° ; $d_{4}^{20} = 1.43$; $mp = 175.3$ (1908). Soluble in hot water, but water sols are unstable. Decomps in aq alkaline solns is almost instantaneous. Freely sol in acetone, alcohol, acetic acid. Sparingly sol in petr ether, chloroform, benzene. Stable to oxidizing agents. Can be detonated, but is not sensitive to percussion or heating.

6750. Nitrous Acid. HNO_2 ; mol wt 47.01. H 2.14%; N 29.79%; O 68.06%. Formed by the action of strong acids on inorganic nitrites. Review: Block, "Nitrous Acid, Hyponitrous Acid and their Salts" in *Mellor's Vol. VIII, supplement II, Nitrogen* (part 2) 353-408 (1967).

Known only in soln (pale blue in color). Weak acid. $K(25^{\circ}) = 4.5 \times 10^{-4}$. In water it changes quickly into nitric oxide and nitric acid. Forms stable, water-sol' salts with Li , Na , K , Ca , Sr , Ba , Ag . Does not form salts with weak polyvalent cations like Al or Be . Forms stable esters with alcohols.

6751. Nitrous Oxide. Dinitrogen monoxide; laughing gas; hypoxynitrous acid anhydride; faintitious gas. N_2O ; mol wt 44.01. N 36.65%, O 36.35%. Constituent of the earth's atm, about 0.00005% by volume: Slobod, Krogh, *J. Am.*

Consult the Name Index before using this section.

